

**Sierra Nevada Conservancy Grant Program
Safe Drinking Water, Water Quality and Supply, Flood Control,
River and Coastal Protection Act of 2006 (Proposition 84)**

Subregion: REGIONWIDE **County:** ALL

Applicant: THE ENVIRONMENTAL DEFENSE FUND

Project Title: ENHANCING WATER SUPPLY AND IMPROVING DAM OPERATIONS THROUGH IMPROVED UPSTREAM FOREST MANAGEMENT

Reference Number: SNC 070314

PROJECT SCOPE

Environmental Defense, in partnership with the University of California, proposes conducting applied research to understand future management strategies for Sierra Nevada forests to provide additional benefit for downstream users. This project addresses promotion of improved forest management practices that will manipulate watershed evapotranspiration to increase the availability of water and to optimize the timing of its delivery. A sound optimization strategy will be developed to protect the ecological integrity of the upland forests, mitigate the risks associated with catastrophic disturbances and increase resilience to climate change.

For this project a multidisciplinary team will launch a twelve month planning phase of a 5 year study to further refine applied research already begun by the Environmental Defense Fund and UC partners.

Steps critical to a successful project include:

- Deployment of a forester and a hydrologist to conduct a detailed assessment of specific potential research sites in the American River watershed and initiate a project GIS system for both planning and implementation;
- Conduct a literature review on improving water use efficiency in forests;
- Identify a sub watershed for treatment and negotiate with landowners for use of properties;
- Collect baseline hydrology information and develop hydrology modeling framework;
- Initiate economic analysis and develop an economic research framework.

During the five year research project, knowledge gained through the planning phase for the American River watershed will be translated to other Sierra Nevada watersheds, thus providing a strong basis for developing partnerships among dam operators and other water users- including upstream public and private forestland owners.

Progress reports will be submitted at six (6) months, twelve (12) months, and eighteen (18) months following the approval of the agreement. Each progress report shall include but not be limited to:

- A summary of work completed during the reporting period;
- A statement of tasks or milestones and a report on the status of each, including public and agency meetings and other partnerships;
- A statement of any challenges or opportunities encountered in accomplishing the scope of work;
- An assessment of deliverables or outcomes as compared to the timeline in the Project Schedule;
- A comparison of actual versus budgeted costs to date; and
- Copies of any other relevant materials produced under the terms of this agreement.

PROJECT SCHEDULE

DETAILED PROJECT DELIVERABLES	TIMELINE
Literature review; improving water use efficiency in forests	July 1, 2008
Written assessment of potential research sites in the American River watershed	July 1, 2008
Six Month Progress Report	September 1, 2008
Identified sub watersheds for treatment/ proof of landowner permission/negotiations.	September 1, 2008
Baseline hydrological information collected	September 1, 2008
Hydrological modeling framework developed/initial simulations analysis	December 1, 2008
Economic analysis initiated and preliminary hypothesis developed.	December 1, 2008
Full written project proposal: including funding strategy for the remainder of the study period.	December 31, 2008
Twelve Month Progress Report	January 1, 2009
Final Report/Final Payment Request	May 1, 2010

PROJECT COSTS

PROJECT BUDGET CATEGORIES	TOTAL SNC FUNDING
PERSONNEL:	\$57,371
Travel	\$4,572
Meetings (Room rental, supplies)	\$762
Misc Expenses (printing, postage, IT, telecom, supplies, media, accounting)	\$1,524
Hydrology Monitoring Equipment	\$5,333
Overhead	\$10,438
GRAND TOTAL	\$80,000

Letters of Support:

- Placer County Water Agency
- University of California: Sierra Nevada Research Institute, Merced; Center for Forestry, Berkeley.

Outstanding:

- Tahoe National Forest
- UC Forest Service Research Station

Recommendation: (LC)

This project addresses long-term water conservation and water quality improvement in upper watershed forests. One of the first to address effects of existing and possible improved forest treatment techniques in areas above water catchment facilities. Addresses climate change scenarios.

(SNC 070314 Enhancing Water Supply and Improving Dam Operations Through Improved Upstream Forest Management)
Section 2 - Project Summary

Forest management decisions upstream of Sierra Nevada dams impact the operations and finances of dam operators and other downstream water users. In fact, water users are strongly interested in promoting improved forest management, but knowledge about the types of optimal treatments and their hydrological, economic, and ecological consequences is relatively weak. Also weak are the financial incentives to influence forest stewardship decisions of public and private landowners.

Managing for hydropower production and water supply involves manipulating watershed evapotranspiration to increase the availability of water and to optimize the timing of its delivery. A sound optimization strategy must protect the ecological integrity of the upland forests, mitigate the risks associated with catastrophic disturbances (e.g, wildfire-driven erosion and damage to water conveyance structures), and increase resilience to climate change. Existing research in this arena has focused mainly on reducing forest evapotranspiration through the removal of a significant proportion of vegetation. This research has rarely led to implementation because the resulting recommendations often conflict with other ecosystem values. We suggest that a more innovative goal is to focus on increasing *water use efficiency* of forested watersheds while maintaining essential ecosystem services such as the provision of wildlife habitat and long-term sequestration of carbon.

A multidisciplinary team will participate in the design and implementation of a multi-year research effort to examine these questions, focusing initially on the American River Watershed. This team will be advised by a stakeholder group including representatives of conservation organizations, water agencies, the US Forest Service, and others. Research will explore three main areas. First, data from instrumented catchments receiving different vegetation and fuel management treatments will be used to establish and validate a predictive modeling capability for both forest and hydrological systems. Selected treatments will then be designed to provide benefits to downstream water operations. Second, economic implications and financial mechanisms to invest in improved watershed management (with attention to hydropower) will be evaluated. Third, we will explore the institutional arrangements and possible financial incentives to link the interests of downstream dam operators and water users to upstream forestland managers.

In the current proposal, we seek \$80,000 from the Sierra Nevada Conservancy to launch a 12 month planning phase (total cost \$125,000) to further refine our applied research concept and prepare for the launch of a five-year research project. During this phase, we will conduct the following activities:

- Deploy a forester and a hydrologist to conduct a detailed assessment of specific potential research sites in the American River watershed and initiate a project geographic information system for both planning and implementation
- Conduct a literature review on improving water use efficiency in forests
- Identify sub-watersheds for treatment and negotiate with landowners for use of property
- Collect baseline hydrology information and develop hydrology modeling framework
- Initiate economic analysis and develop an economic research framework

During the 5-year research project, knowledge gained through the planning phase for the American River watershed will be translated to other Sierra Nevada watersheds thus providing a strong basis for developing partnerships among dam operators and other water users including upstream public and private forestland owners.

